SYSTEM LEVEL VIRTUAL REALITY PRIVACY SETTINGS

CROSS REFERENCE TO RELATED APPLICATION

This application claims priority to U.S. Provisional Application No. 62/408,248, filed on Oct. 14, 2016, entitled "SYSTEM LEVEL VIRTUAL REALITY PRIVACY SETTINGS", the disclosure of which is incorporated herein by reference.

TECHNICAL FIELD

This description generally relates to maintaining privacy for information used in virtual reality (VR) environments.

BACKGROUND

Virtual reality environments that allow multiple users to interact may provide for any number of interaction methods. While interacting in a multi-user VR space, user actions and inputs may be viewed by other users in the VR space. In addition, tracking mechanisms can capture and record user actions and input with cameras and sensors. Such an environment, however, may not provide for exchange of information in a desirable fashion.

SUMMARY

A system of one or more computers can be configured to perform particular operations or actions by virtue of having software, firmware, hardware, or a combination of them installed on the system that in operation causes or cause the system to perform the actions. One or more computer programs can be configured to perform particular operations or actions by virtue of including instructions that, when executed by data processing apparatus, cause the apparatus to perform the actions.

In one general aspect, a computer-implemented method is described that includes configuring, with a processor, a plurality of privacy properties for a plurality of virtual objects associated with a first user accessing a virtual environment using a device associated with the first user, triggering for display, in the virtual environment, at least one of the plurality of virtual objects to the first user accessing the virtual environment, and determining whether the at least one virtual object is associated with a privacy setting corresponding to the first user. In response to determining that a second user is attempting to access the at least one virtual object, the method may also include applying a visual modification to the at least one virtual object based at least in part on a privacy setting associated with the at least one virtual object and triggering for display, in the virtual environment, the visual modification of the at least one virtual object to the second user while continuing to trigger display, to the first user, the at least one virtual object without the visual modification.

Implementations may include one or more of the following features. The method may further include having the visual modification apply to a portion of the at least one virtual object. The modification may include modifying display of the at least one virtual object for the second user by randomizing pixels depicting motions associated with the portion. Implementations of the described techniques may include hardware, a method or process, or computer software on a computer-accessible medium.

In some implementations, the method may include triggering for display, on the at least one virtual object, an icon in which to select a privacy mode, receiving, from the user, a selection on the icon, triggering hiding of the at least one virtual object from display to users other than the first user, if the selection represents a private privacy mode, and triggering revealing of the at least one virtual object in the virtual environment to at least a portion of users accessing the virtual environment, if the selection represents a public privacy mode. Implementations of the described techniques may include hardware, a method or process, or computer software on a computer-accessible medium.

In some implementations, the method may further include determining, for the first user, a context of use for at least one of the plurality of virtual objects in the virtual environment, and triggering for display, in the virtual environment, the at least one virtual object to the first user. In response to determining the second user is accessing the virtual environment, applying a visual modification to the at least one virtual object based at least in part on the context of use associated with the at least one virtual object, and triggering for display the visual modification of the at least one virtual object to at least a portion of the additional users until determining that the context of use is a public use associated with the at least one virtual object. Implementations of the described techniques may include hardware, a method or process, or computer software on a computer-accessible medium.

In some implementations, the method may further include detecting an input associated with the at least one virtual object, determining that the input is associated with data corresponding to the at least one virtual object and a privacy setting, determining that the user is entering additional input corresponding to the at least one virtual object, and changing the privacy setting associated with the at least one virtual object from public to private in response to determining that the additional input includes personal data. Implementations of the described techniques may include hardware, a method or process, or computer software on a computer-accessible medium.

In some implementations, changing a privacy setting associated with the at least one virtual object from public to private includes modifying for the second user, a view of the at least one virtual object including the input, the personal data, and the additional input. In some implementations, modifying the view of the at least one virtual object includes scrambling pixels associated with the input when displaying the input to the second user. Implementations of the described techniques may include hardware, a method or process, or computer software on a computer-accessible medium.

In some implementations, the method may further include determining that the input includes a first gesture, performed by the first user, the first gesture including holding a computing device with a display screen facing the first user, and determining that the additional input includes a second gesture, performed by the first user, the second gesture including holding the computing device facing away from the first user so as to indicate screen content is available for viewing by the second user. In response to detecting the second gesture, the method may include changing a privacy setting associated with the computing device from private to public and displaying the screen content, in the virtual environment, to the second user accessing the virtual environment. Implementations of the described techniques may include hardware, a method or process, or computer software on a computer-accessible medium.